CLAIMS

1. A polynucleotide exhibiting allosteric properties such that reversible interaction of a chemical effector, a physical signal, or combinations thereof, with an allosteric site on the polynucleotide reversibly alters the function or configuration of the polynucleotide.

2. A polynucleotide according to claim 1 wherein the alteration occurs in less than 60 minutes.

3. A polynucleotide according to claim 1 which has an allosteric binding site that interacts with a chemical effector.

4. A polynucleotide according to claim 1 which is RNA.

5. A polynucleotide according to claim 1 which is DNA.

6. A polynucleotide according to claim 1 which comprises both DNA and RNA.

7. A polynucleotide that is an enzyme exhibiting allosteric properties wherein the rate of catalysis of the enzyme is reversibly modulated by interaction with a chemical effector.

8. A polynucleotide according to claim 7 which is RNA.

9. A polynucleotide according to claim 7 which is DNA.

10. A polynucleotide according to claim 7 which comprises both RNA and DNA.

11. A polynucleotide according to claim 7 wherein observable modulation occurs in less than 6 minutes.

12. A polynucleotide according to claim 11 wherein observable modulation occurs in less than 1 minute.

13. A polynucleotide according to claim 7 wherein the chemical effectors are metal ions or small molecules having a molecular weight of 300 or less.

14. A polynucleotide according to claim 7 wherein the chemical effectors are selected from the group consisting of amino acids, amino acid derivatives, peptides, nucleosides, nucleotides, steroids, and mixtures thereof.

15. A biosensor comprising a catalytic polynucleotide according to claim 7.

16. A method for detecting the presence or absence of a compound or its concentration in a sample comprising contacting the sample with a polynucleotide exhibiting allosteric properties such that reversible interaction of the compound with an allosteric site on the polynucleotide alters the function or configuration of the polynucleotide.

17. A method according to claim 16 wherein the polynucleotide is an enzyme.

18. A method according to claim 16 wherein the presence or absence of a compound or its concentration is detected by observation of polynucleotide self-cleavage.

19. A method according to claim 16 wherein the chemical effectors are metal ions or small molecules having a molecular weight of 300 or less.

20. A polynucleotide according to claim 16 wherein the chemical effectors are selected from the group consisting of amino acids, amino acid derivatives, peptides, nucleosides, nucleotides, steroids, and mixtures thereof.